

REMARKS

Presently, claims 9-22 are pending in the instant application. Applicants cancel claims 14, 15, and 17-20. Additionally, independent claim 9 has been amended to clarify the location of the vent pipe relative to the other elements of the invention. Thus, claims 9-13, 16, and 21-22 remain pending.

In the Office Action, claims 9, 12, 14 - 18, 21, and 22 stand rejected under 35 USC § 102(b) as being allegedly anticipated by United States Patent No. 4,248,378 to Carruthers. (hereinafter "Carruthers"). Also, claims 10, 11, 13, 19, and 20 stand rejected under 35 USC § 103(a) as being allegedly obvious and unpatentable over Carruthers in view of the Examiner's assertion that Applicants have failed to establish any criticality or synergistic results which are derived from the recited configurations, which renders these claims a matter of obvious design choice. Each of these rejections is respectfully traversed.

The claimed invention as set forth in independent claim 9, is directed to an installation for the preparation of hot water, that includes a cold water reservoir, a heating unit, a cold water pipe between the cold water reservoir and the heating unit, a draw-off point for drawing off hot water, a hot water pipe between the heating unit and the draw-off point, a pump for making water flow from the cold water reservoir through the cold water pipe, the heating unit and the hot water pipe to the draw-off point, and a vent pipe connected to at least one of the cold water pipe and the hot water pipe.

Further, as presently claimed in amended independent claim 9, the vent pipe runs upwards to the level above a highest water level in the installation and runs downwards from the level, and a section of the vent pipe running downwards discharges above the cold water reservoir.

In view of the anticipation rejection, the Office Action alleges that Carruthers teaches each and every element of the invention as claimed in the application. Although the Office Action does not offer any discussion or explanation, support for the anticipation rejection appears to be based upon the Examiner's reference to Carruthers' FIG. 2, element 25, and col. 3, lines 10 - 32. Neither FIG. 2, element 25, nor col. 3 lines 10 - 32 of Carruthers disclose Applicants' invention as recited in claim 9 as amended, and as further distinguished in dependent claims 12, 16, 21, and 22. In fact, Carruthers at great length describes his indirect domestic

water heating system to be limited to the closed, pump-driven, and recirculating primary hot water circuit, as is illustrated in the figures and described in the accompanying disclosure. Carruthers further restricts the scope of his indirect water heating system to incorporate a cold water header tank 22 that uses gravity to supply a heat exchanger 20 that is heated by the separated primary hot water circuit.

In contrast, Applicants' invention is directed to continuous-flow, single fluid circuit, non-recirculating, hot water preparation installations. Unlike Applicants' invention, Carruthers disclosure is also limited to systems that only incorporate a vent 11 that actuates manually or when dry to vent air for purposes of filling the primary hot water circuit. Also, the Carruthers teachings are limited to those water heating applications that incorporate a vent 25 only for the separate, secondary, gravity fed, cold water circuit.

Carruthers also lacks any suggestion or disclosure of Applicants' claimed pump for making water flow from the cold water reservoir through the cold water pipe, the heating unit, and the hot water pipe to the draw-off point. In further contrast, Carruthers is limited to a pump 19 that circulates hot water in the primary water circuit, while cold water circulates separately under pressure from header tank 22 (col. 3).

Additionally, in contrast to the Examiner's contention that Carruthers anticipates each and every element of Applicants' invention, and as Applicants have further clarified in the instant amendment to claim 9, Applicants' novel positioning and use of vents 23, 24 (FIG. 2), vents 39, 40 (FIG. 3), and vents 59, 60, 66, 67 (FIG. 4), positively vents vapor and air bubbles created and or entrained from the various sources already described, namely, cold water introduction, pump action, heating, and the like. This multi-faceted capability is a result of Applicants' configuration as claimed in independent claim 9, and as further contemplated in subsequently dependent claims 10-12, 16, and 21-22. These features are not disclosed, suggested, or contemplated by Carruthers' closed, recirculating primary hot water circuit, and his open, gravity-pressurized, secondary cold water circuit.

From these comparisons between Applicants' inventive hot water preparation installation and the indirect domestic water heating system of Carruthers, it is apparent that Carruthers does not teach or disclose each and every element of Applicants' uniquely configured hot water preparation installations and vent arrangements.

Accordingly, Applicants request reconsideration of the anticipation rejection and submits that the rejection of independent claim 9, especially as amended to clarify the possible arrangements of the vents, should be withdrawn since Carruthers does not disclose each claimed element. For the same reasons, the Examiner's anticipation rejection of claim 12 should also be withdrawn, since this claim depends from claim 9, and recites a variation that positions Applicants' vent between the heating unit and the pump, which is not taught or suggested by Carruthers.

Applicants' claim 16 depends from claim 9, claim 21 depends from claim 10, and claim 22 depends from claim 12. Each of these dependent claims 16, 21, and 22 further distinguish Applicants' invention from the restricted embodiments of Carruthers. This differentiation is especially evident in view of Applicants' claimed cold water reservoir being controlled with the level meter, which automatically induces operation of the actuatable cold water tap to keep the reservoir filled. Applicants' claimed modifications to the embodiments of the invention are not disclosed or contemplated by Carruthers. Thus, Applicants request reconsideration of the anticipation rejections over Carruthers and submit that the rejection of claims 16, 21, and 22 are improper and should be also withdrawn.

Next, the Office Action contends that Applicants' claims 10, 11, and 13, among others, are obvious in view of Carruthers because the claimed configurations fail to establish criticality and or synergistic results that are derived from the variations, which renders the dependent claims as improvements that are obvious to those skilled in the arts. Applicants traverse this allegation with support that the claims establish criticality and synergistic results as described in FIGS. 2-4, and on page 5, lines 5-19; page 6, lines 7-10; and again on page 7, lines 7-12.

Notably, Carruthers is tellingly silent regarding the problems long-known to those skilled in the art, namely problems caused by entrapped and dissolved vapor and air bubbles in prior art hot water heating systems. While Carruthers is devoid of any appreciation of these problems, Applicants solve these problems with the correct arrangement and use of the novel elements of Applicants' inventive installation.

Applicants recognize that bubbles and vapor can detrimentally impact pump performance, can adversely influence continuous, calm, and uniform water flow, and can have undesirable effects on the measurement of the water flow. Such air bubbles and vapor can

influence water flow through the water circuit because the bubbles and vapor can cling to the wall of the pipes. See page 2, lines 5-16, and page 4, lines 29-30 of Applicants' disclosure. Heating units can supply sputtering hot water. See, for example, page 5, lines 15-16.

In contrast, Carruthers not only fails to recognize such problems, but the separated primary and secondary water circuits of Carruthers limited device can not function as Applicants' continuous flow, single circuit, hot water preparation installation. This is true even if Carruthers is modified, using Applicants' invention as a road map, to be a single circuit, continuous low circuit having vents positioned as illustrated by Applicants.

Applicants recognize in pages 1-3 of the instant application that vapor and air bubbles can be introduced into hot water preparation installations from the turbulent introduction of fresh, cold water, from the turbulent mixing action of the pump, and from the heating of the water. Applicants specifically address a solution to each of the problems resulting from such vapor and air bubbles in the installation and illustrates a new vent tube that is used to remove the problematic air bubbles and vapor through the claimed novel configurations.

In the instance of vapor and air bubbles entrained from the turbulent introduction of cold water into the inventive installation, Applicants describe in FIG. 2 the incorporation of vent pipe 23, which is connected at the highest point of the water circuit where bubble are most likely to collect. See also, page 5, lines 9-12. Furthering distinguishing his invention, Applicants at page 5, line 12 introduce another vent pipe 24 to vent bubbles and vapor induced by the heating unit 11.

Applicants also describe further benefits of the installations according to the principles of the invention in FIGS. 3 and 4, wherein the flow meter can be excluded as a result of the more uniform stream of water that results from the advantageous use and placement of vents. In variations of their preferred embodiments, Applicants illustrate in FIG. 3, vents 39 and 40 placed respectively downstream of the heating unit 31 and the pump 35 to vent the vapor and air bubbles created thereby.

In further improvements to the prior art heretofore unavailable, Applicants devise additional modifications to their preferred embodiments where in FIG. 4 they improve vents 59, 60 to have respective downward extension 66 and downward running section 67 extending above cold water reservoir 50. In this variation, the condensate that may result from the vented air bubbles and vapor will be re-introduced into the water circuit upstream of the vents 59, 60 so as

to maintain the preferred uniform and calm flow or stream of water through the hot water preparation installation.

In contrast to the Examiner's assertion that Applicants fail to establish criticality or synergistic results as claimed and illustrated, Applicants maintain that the configurations as specifically described, result in very different results from those contemplated in Carruthers and other prior art systems. Moreover, the Applicants' claimed configurations directly address the specific problems associated with entrained air bubbles and vapor in hot water preparation installations. Applicants' claimed solution to each of these problems establishes a previously unavailable solution that can be incorporated in a variety of hot water preparation installations.

For each of these reasons, and in view of that fact that Carruthers does not anticipate independent claim 9, Applicants request reconsideration and submit that the obviousness-type rejection of claims 10, 11, and 13 are improper and should be withdrawn.

CONCLUSION

For each and all of the preceding reasons, Applicants respectfully request withdrawal of the anticipation and obviousness-type rejections of the claims, a favorable reconsideration, and an early notice of allowance in view of the evident allowability of the presently pending claims in the instant application.

Should the Examiner wish to discuss any of these issues in further detail for purposes of bringing prosecution to a close, the Examiner is invited to contact Applicants' undersigned representative by telephone at 412-471-8815.

Respectfully submitted,
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